Chapter 0   Introduction

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Content

- Bloating of complexity

- Java and C++

- About this course
  - Course Arrangement
  - Materials
  - How to learn
  - Self-teaching

- Course design

- Bloating

- Complexity
  - Complexity of problems and data
  - Complexity of programs
    - More complex logical fundament
    - More abstract model
    - Easier grammar

- Evolution of program language
  - Machine、 Assembly
  - Procedure oriented
  - Object oriented / Aspect oriented

- Evolution of capsulation
  - Class library
  - Design pattern
  - Framework
  - Service

Increase of capsulation

Dilemma

- Dilemma in programming
  - Increasing user need (Security, Transaction…)
  - Increasing size of software modules
  - Decreasing efficiency of software development
  - Increasing cost of maintenance
- The goal of Java since its birth
  - Using precise, easy-to-read, secured program for problem solving
  - Thinking in Java

- The pointer

- String

- DLL

- Portability

- Multiple inheritance

- Garbage Collection

- The pointer

```
// Move and inverse memory
int i;
for(i=0;i<=size;i++){
    to_block[size-i] = from_block[i]; // Can you see the bug?
}
```

- ## String

```
char str [] = "Hello"; //C-style
...
String str = "Hello, I'm feeling a little better."; //ANSI C++ from 1997
```

- DLL version compatibility
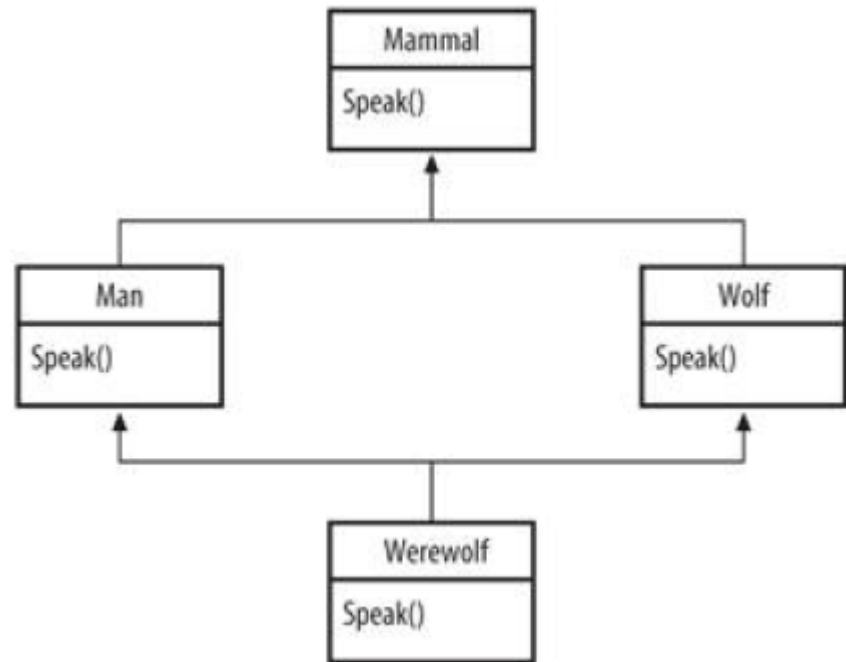
- Portability

- Multiple inheritance

多继承问题

```
          ┌──────────┐
          │  Mammal  │
          ├──────────┤
          │ Speak()  │
          └──────────┘
               ▲
        ┌──────┴──────┐
┌──────────┐      ┌──────────┐
│   Man    │      │   Wolf   │
├──────────┤      ├──────────┤
│ Speak()  │      │ Speak()  │
└──────────┘      └──────────┘
     ▲                 ▲
     └────────┬────────┘
        ┌──────────┐
        │ Werewolf │
        ├──────────┤
        │ Speak()  │
        └──────────┘
```

- Garbage Collection

System.gc();
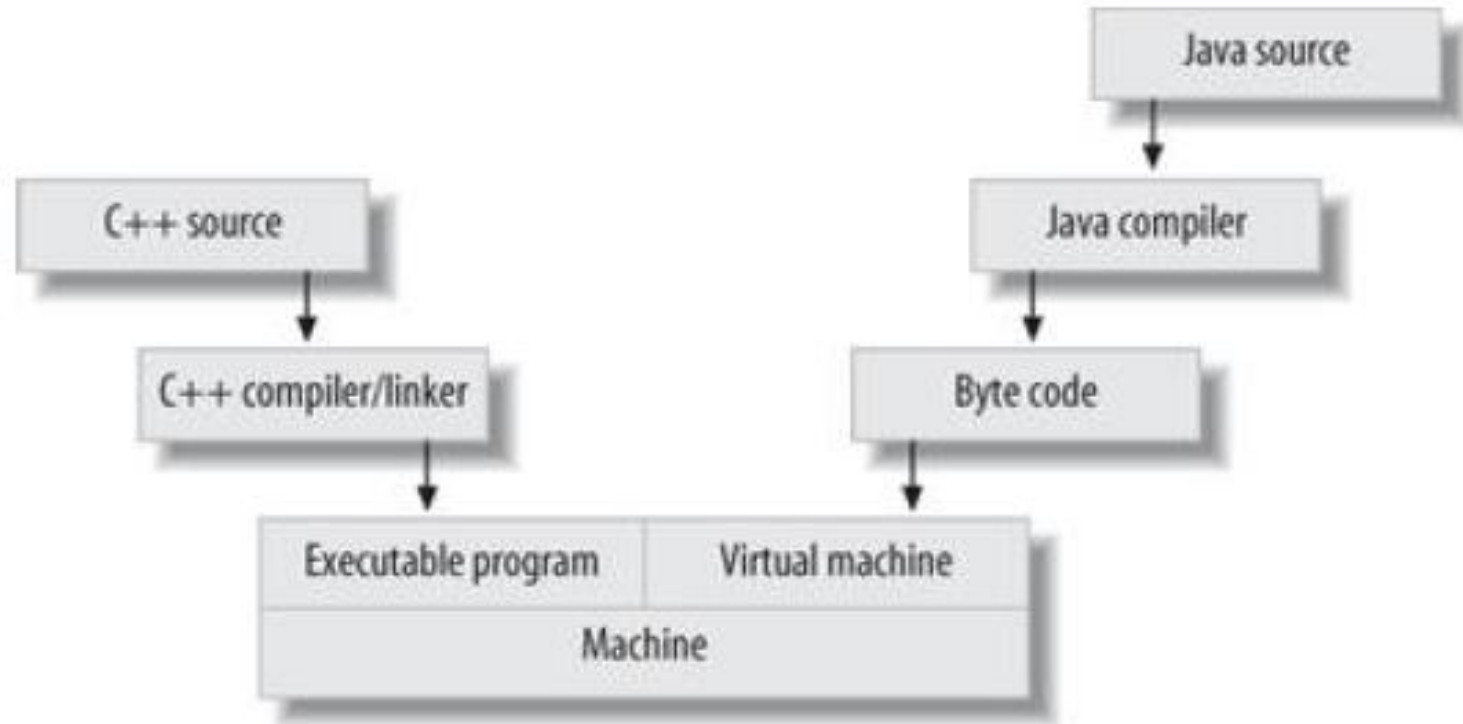
delete

Java and C++ - Java Solution

- JVM portability: Write Once, Run Anywhere
- Byte code specification: specified JVM and Java language
- Limited memory access by JVM: sandbox
- Meta-model : Reflective Programming
- Automatic garbage collection
- Pointer removed

- *What is the pros and cons of Java?*

Week	Content	Category
W1	Introduction, Java Fundamentals	Fundamental
W2	Java OOP I (Classes and Objects)	
W3	Java OOP II (Abstract, Inheritance, Polymorphism)	
W4	Java OOP II (Abstract, Inheritance, Polymorphism)	
W5	Java Exception	
W6	Java I/O	
W7	Java Collection; Java Generic Type	
W8	Java and UI;	Advanced
W9	Java Multithread; Java and Markup; Grouping; DP Assignment	
W10	JDBC	
W11	Java Network Programming	
W12	Design Pattern 1,2,3; Final Project Assignment	Design pattern
W13	Design Pattern 4,5,6	
W14	Design Pattern 7,8,9	
W15	Final Project; Q&A	

Week	Classroom	
W1	J2-305 (Mon. 8-9)	COSE268 (Wed.3-5)
W2	COSE268(Mon. 8-9)	COSE268 (Wed.3-5)
W3	COSE268(Mon. 8-9)	COSE268 (Wed.3-5)
W4	COSE268(Mon. 8-9)	COSE268 (Wed.3-5)
W5	COSE268(Mon. 8-9)	COSE268 (Wed.3-5)
W6	COSE268(Mon. 8-9)	COSE268 (Wed.3-5)
W7	COSE268(Mon. 8-9)	COSE268 (Wed.3-5)
W8	COSE268(Mon. 8-9)	COSE268 (Wed.3-5)
W9	COSE268(Mon. 8-9)	COSE268 (Wed.3-5)
W10	COSE268(Mon. 8-9)	COSE268 (Wed.3-5)
W11	COSE268(Mon. 8-9)	COSE268 (Wed.3-5)
W12	COSE268(Mon. 8-9)	COSE268 (Wed.3-5)
W13	COSE268(Mon. 8-9)	COSE268 (Wed.3-5)
W14	COSE268(Mon. 8-9)	COSE268 (Wed.3-5)
W15	COSE268(Mon. 8-9)	COSE268 (Wed.3-5)

Materials

- The best textbook is Javadoc !!!

- Textbook:

  o Java Programming Language 4ed

- Readings:

  o Thinking in Java

  o Head first Java

  o Better, Faster and Lighter Java（轻快的好Java）

  o Beyond Java

  o Inside Java Virtual Machine…

- Data formats: HTML, XML

- Java platform: J2ME, J2EE

- WWW Architecture / SOA

- ## How to study Java in a AGILE way?

  - TYPE the examples in the textbook

  - Learn to use Javadoc

  - Don't focus on the grammar details

  - Fully use of open-source community

    - Sun Developer Network

    - Sourceforge

  - Other resources:

    - www.java2s.com : code examples, tutorials

- The installation of JDK

- Setup of Classpath

- *Use of Ant

Forecast

- Evolution of Java

- JDK and JRE

- Java Operating Mechanism

- Java Developing Environment

- Java Primary Data Types

- Java Basic Grammar